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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

ED 070772

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

CARD TENDER (asbestos prod.; textile) 6-19.031

~~B-618~~
S-338

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U. S. Employment Service
in Cooperation with
North Carolina State Employment Service

 GATB# 2514

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

CARD TENDER (asbestos prod.; textile) 6-19.031

B-618

Summary

The General Aptitude Test Battery, B-1002B, was administered to a final sample of 53 men employed as Card Tenders 6-19.031 at Cannon Mills, Kannapolis, North Carolina. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes K-Motor Coordination and M-Manual Dexterity were selected for inclusion in the final test norms.

GATB Norms for Card Tender 6-19.031, B-618

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
T	CB-1-G CB-1-K	65	K	Part 8	70
M	CB-1-M CB-1-N	70	M	Part 9 Part 10	70

Effectiveness of Norms

The data in Table IV indicate that only 64 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 74 percent would have been good workers. 36 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 26 percent would have been poor workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Card Tender 6-19.031.

II. Sample

The GATB, B-1002B, was administered in October 1964 to 57 men employed as Card Tender 6-19.031 at Cannon Mills, Kannapolis, North Carolina. Cannon Mills employs 208 Card Tenders. Workers included in the sample were selected by management and represented a cross-section of all workers. Of the 57 tested workers, 4 were eliminated from the final sample because of difficulty in taking the GATB. The final sample consisted of 53 men. Workers at this plant are selected on the basis of a personal interview. The on-the-job training period consists of one month of training by an experienced worker and/or the department foreman.

TABLE I

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

N = 53	M	σ	Range	r
Age (years)	32.5	13.7	17-68	.086
Education (years)	8.6	2.2	4-13	.085
Experience (months)	69.4	85.1	1-336	.196

III. Job Description

Job Title: Card Tender (asbestos prod; textile) 6-19.031

Job Summary: Tends carding machines that open and clean cotton, and sliver from picker laps. Pushes lap truck from picker room to card room and positions truck near carding machines to be creeled. Removes lap from rack on truck and places lap on lap rack of carding machine. Removes pin that holds lap in brackets of lap roll from nearly exhausted lap in machine and places pin in handtruck. Locates end of lap on rack and removes layers from lap when edges of layers are uneven to produce sliver of uniform weight. Places cotton removed from lap into specified container for reprocessing. Lowers lap from lap rack onto lap roll when end of exhausting lap reaches feed roll of carding machine. Lays end of lap on lap roll against the end of exhausting lap to replenish lap supply to carding machine. Patrols carding machines to detect broken sliver, defective card web, and lint built up on machine. Pulls lever to stop machine, picks up end of broken sliver, rolls, and twists end, and inserts end into trumpet of coiler head to coil sliver into can. Lifts clearer roll, calender cleaner roll, and scavenger roll from brackets on carding machine, pulls cotton waste from rolls and places waste into container. Replaces rolls on brackets and cleans outside surface of carding machine using brush and mop. Opens trap under carding machine and removes waste from under machine using rake. Notifies Card Grinder when defects in card web occur.

IV. Experimental Battery

All the tests of the GATB, B-1002B , were administered to the sample group.

V. Criterion

The criterion data were collected during the period October 14-27, 1964 and consisted of two sets of independent ratings made by the immediate supervisors on USES Form BF-21, "Descriptive Rating Scale." The rating scale consisted of nine items covering different aspects of job performance, with five alternatives for each item. Weights of one through five, indicating the degree of job proficiency attained, were assigned to the alternatives. A reliability coefficient of .82 was obtained for the criterion. Therefore, the two sets of ratings were combined, resulting in a distribution of final criterion scores of 41-83 with a mean of 63.5 and a standard deviation of 10.2

VI Qualitative and Quantitative Analyses

A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Form Perception (F) - required to detect flaws, such as broken sliver, defective card web, uneven layers of fiber, exhausting lap of cotton fibers, and to observe the amount of accumulation of lint on machine.

Manual Dexterity (M) - required to push hand truck, operate levers of machine, load lap on rack, feed lap to machine and to clean carding machine.

On the basis of the job analysis data, Numerical Aptitude (N) and Clerical Perception (Q) were rated irrelevant for success in this occupation.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 53

Aptitudes	M	σ	r
G-Intelligence	79.5	15.3	.180
V-Verbal Aptitude	79.7	10.8	.164
N-Numerical Aptitude	76.4	19.6	.200
S-Spatial Aptitude	88.7	17.6	.109
P-Form Perception	95.4	22.1	.063
Q-Clerical Perception	88.8	16.7	.140
K-Motor Coordination	81.3	17.8	.277*
F-Finger Dexterity	79.6	21.5	-.064
M-Manual Dexterity	91.9	20.8	.038

*Significant at the .05 level

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important					X				X
Irrelevant			X			X			
Relatively High Mean				X		X			X
Relatively Low Sigma		X							
Significant Correlation with Criterion							X		
Aptitudes to be Considered for Trial Norms							X		X

Trial norms consisting of various combinations of Aptitudes K and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of K-70 and M-70 had the best selective efficiency.

VII. Validity of Norms

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 36 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes K and M, with critical scores of 70 and 70, respectively, and the dichotomized criterion for Card Tender 6-19.031. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Card Tender 6-19.031
(K-70, M-70)

N = 53	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	6	28	34
Poor Workers	9	10	19
Total	15	38	53

Phi Coefficient = .316
χ^2 = 5.295
P/2 < .025

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes K and M, with a minimum score of 70 and 70, respectively, have been established as B-1002 norms for Card Tender 6-19.031 The equivalent B-1001 norms consist of T-65 and M-70.

IX. Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.